Chapter 8
Troubleshooting

This chapter explains equipment trouble and how to remedy it.
When trouble is detected by one of the self-check features, the trouble is displayed on the instrumentation panel display and a trouble buzzer is sounded. For trouble undetected in self-checks and misoperation which can be easily mistaken as trouble, see "8.2 Before You Call for Service".

8.1 Alarm and Action

⚠ DANGER

- **ELECTRIC SHOCK! Before working on the power circuits on the primary side of the main power switch (leakage breaker), shut OFF primary power supply and check the line is dead. Also, take measures to prevent accidental charging.**
  Working with primary power supply ON runs the risk of electric shock.
- **Shut OFF power from the main power switch BEFORE detaching the electric parts compartment door.**

The Compact Ultra Low Temperature Chamber is equipped with a buzzer that sounds when detects trouble as well as self-check features which display the trouble on the instrumentation panel display. Displayed alarm codes and their content are given in the alarm table on the following pages. Remedy trouble as described therein.
For trouble which is undetected in self-checks, see "8.2 Before You Call for Service". If the trouble cannot be remedied after taking the prescribed action, contact the place of purchase or ESPEC CORP.

Clearing Alarms

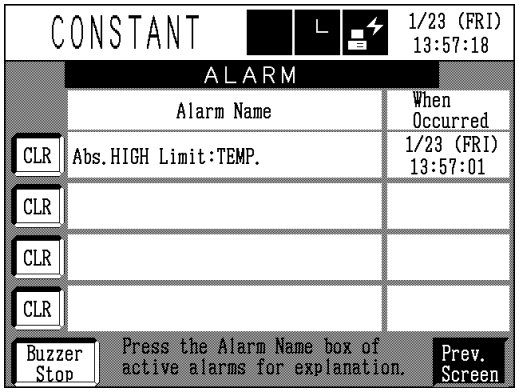
The chamber will be in one of the below states when an alarm occurs. The alarm is cleared in a different way depending on what your needs are at that time. Procedures for clearing the alarm in each of these cases are given on the following pages.

- Running in the constant mode
- Running in the program mode but not needing to continue after clearing the alarm
- Running in the program mode and needing to continue after clearing the alarm

■When running in the constant mode or when running in the program mode but not needing to continue after clearing the alarm

Procedure

1. Press the Buzzer Stop button on the Alarm screen to silence the buzzer.



2. If the chamber is running, press either the OPER./STOP key on the operating panel or the chamber operating status box on the screen to get the Operation Mode Selection screen.
   Then, press the STOP button under Stop Operation.

3. Press the POWER key to deactivate control power.

4. Set the main power switch in the OFF position.

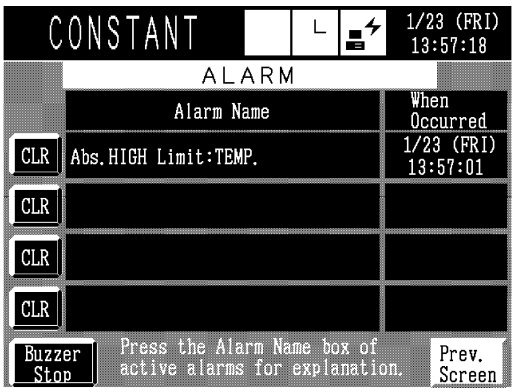
5. Remedy the trouble for the alarm displayed on the Alarm screen as explained in the alarm table.

6. Set the main power switch in the ON position and then activate control power.
   The display will come on and the main menu will appear shortly.

■When running in the program mode and needing to continue after clearing the alarm

Procedure

1. Press the Buzzer Stop button on the Alarm screen to silence the buzzer.



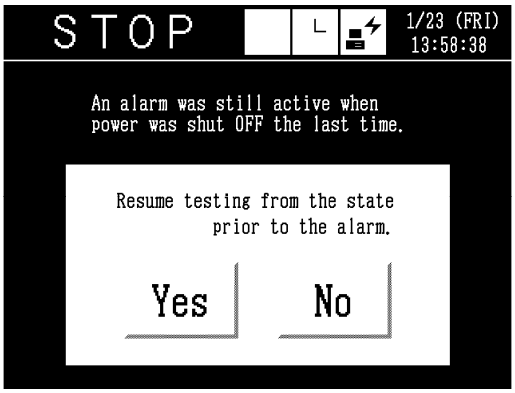
2. Press the POWER key to deactivate control power.
   Check the alarm table. If there is no need to shut OFF primary power supply, leave the main power switch in the ON position.

3. Remedy the trouble for the alarm displayed on the Alarm screen as explained in the alarm table.

4. Reactivate control power.

5. If main power switch was left in the ON position, a message confirming whether to resume testing from the state prior to the alarm or not will appear on the screen.
   If the main power switch was set in the OFF position, set it in the ON position and then activate control power to start the chamber.

   Yes button : Resumes testing from the state prior to the alarm.
   No button : Leaves the chamber stopped.



Alarm Table

Table 8.1 Alarm table

Displayed alarm code/channel code (option)	Trouble	Cause	Remedial action
BURN-OUT Ai-0ch 〔0〕	The room temperature compensation input to the temperature controller was disconnected. The chamber has been stopped.	The sensor is loosely connected to the RTD terminal on the SCP-220 temperature controller board or there is an open circuit on the SCP-220 board.	Turn control power OFF from the POWER key and resume testing. If the same alarm occurs again, call for service.
BURN-OUT Ai-1ch 〔0〕	The dry-bulb input to the temperature controller was disconnected. The chamber has been stopped.	The sensor is loosely connected to the TD terminal on the SCP-220 temperature controller board or there is an open circuit in the connected thermocouple.	Turn control power OFF from the POWER key and resume testing. If the same alarm occurs again, call for service.
UPPER DEV. LIMIT : TEMP. 〔1〕	The temperature inside the chamber has risen above the upper deviation limit. The heater has been stopped until temperature returns within range.	Either specimens inside the chamber are generating heat or the upper deviation limit is set too low.	Remove the heat-generating specimens and/or set the upper deviation limit about 10°C higher than the target temperature. When temperature returns within range, normal control is restored automatically. The alarm can be cleared by pressing the CLR key.
ABS.HIGH LIMIT : TEMP. 〔2〕	The temperature inside the chamber has risen above the absolute high limit. The chamber has been stopped.	Either specimens inside the chamber are generating heat or the absolute high limit is set too low.	Turn control power OFF from the POWER key. Then, remove the heat-generating specimens and/or set the absolute high limit about 15°C higher than the target temperature. Resume testing. If the same alarm occurs again, call for service.
ABS.LOW LIMIT : TEMP. 〔3〕	The temperature inside the chamber has dropped below the absolute low limit. The chamber has been stopped.	Possible causes include infiltrating of outside air, excessive cooling, the effects of cooling sources inside the chamber, and the absolute low limit being set too high.	Turn control power OFF from the POWER key and check the chamber door and cable port. If the refrigerator is on manual control, correct the capacity setting. If cooling sources are overcooling the chamber, reduce their number. Also, correct the absolute low limit setting as necessary. Then, resume testing. If the same alarm occurs again, call for service.

Cont.

Displayed alarm code/channel code (option)	Trouble	Cause	Remedial action
OVERHEATING 〔6〕	The temperature inside the chamber has risen above the overheat protector setting (instrumentation panel). The chamber has been stopped.	Either specimens inside the chamber are generating heat or the overheat protector is set too low.	Turn control power OFF from the POWER key. Remove the heat-generating specimens and/or correct the overheat protector setting. Resume testing. If the same alarm occurs again, it is possible that the overheat protector is damaged or that the thermal fuse has blown. Call for service.
BLOWER FAILURE 〔7〕	The built-in temperature switch of the air circulator motor (electric parts compartment) tripped because the motor is abnormally hot. The chamber has been stopped.	The air circulator motor is either locked or overloaded, perhaps because it is caught on something.	Leave the chamber OFF until the air circulator cools down. Then, turn control power ON from the POWER key and resume testing.
REFRIG. : OVERCURRENT FAILURE 〔8〕	The thermal relay tripped because refrigerator operating current was high. The chamber has been stopped.	The refrigerator is overloaded because of overheating, condenser filter clogging or some other reason.	Turn control power OFF from the POWER key. Check if the condenser filter is clogged and reset the thermal relay manually. Resume testing. If the same alarm occurs again, call for service.
REFRIG. : SURFACE TEMP. HIGH 〔8〕	The compressor temperature switch tripped because refrigerator surface temperature was high. The chamber has been stopped.	The refrigerator is overloaded because of overheating, condenser filter clogging or some other reason.	Turn control power OFF from the POWER key. Check if the condenser filter is clogged. Correct as necessary and resume testing. If the same alarm occurs again, call for service.
REFRIG. : CONDENSER FAN FAILURE 〔8〕	The thermal relay of the condenser fan tripped because fan operating current was high. The chamber has been stopped.	The refrigerator is overloaded because of overheating, condenser filter clogging or some other reason.	Turn control power OFF from the POWER key. Check if the condenser filter is clogged and reset the thermal relay manually. Resume testing. If the same alarm occurs again, call for service.
POWER PHASE FAILURE 〔19〕	A reverse or open phase was detected in the 3ϕ primary power supply connection. The chamber has been stopped.	Primary power supply is not correctly connected to the chamber.	An incorrect power supply can seriously affect chamber components. Set the main power switch (leakage breaker) in the OFF position, and check/correct primary power supply phase alignment and connections. Then, reactivate the system from the main power switch followed by the POWER key, and resume testing. If the same alarm occurs again, call for service.
COMMUNICATION ERROR-1 〔99〕	The instrumentation (CPU board) detected communication trouble in the display board. The chamber has been stopped.	Communication trouble between CPU board and display board	Reactivate the system from the main power switch (leakage beaker) and resume testing. If the same alarm occurs again, call for service.

Cont.

Displayed alarm code/channel code (option)	Trouble	Cause	Remedial action
COMMUNICATION ERROR-2 〔99〕	The instrumentation detected system trouble in the display board. The chamber has been stopped.	Display board error (i.e.: internal memory, etc.)	Reactivate the system from the main power switch (leakage breaker) and resume testing. If the same alarm occurs again, call for service.
COMMUNICATION ERROR-4 〔99〕	The instrumentation detected system trouble in the CPU board. The chamber has been stopped.	Sequence task error on CPU board	Reactivate the system from the main power switch (leakage breaker) and resume testing. If the same alarm occurs again, call for service.
COMMUNICATION ERROR-5 〔99〕	The instrumentation detected system trouble in the CPU board. The chamber has been stopped.	Refrigeration task error on CPU board	Reactivate the system from the main power switch (leakage breaker) and resume testing. If the same alarm occurs again, call for service.
COMMUNICATION ERROR-6 〔99〕	The instrumentation detected system trouble in the CPU board. The chamber has been stopped.	Temperature control task error on CPU board	Reactivate the system from the main power switch (leakage breaker) and resume testing. If the same alarm occurs again, call for service.